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ABSTRACT

This report, prepared by the Delinquency and School Environments Program of the Center for Social Organization of Schools, presents a set of standards for implementing Program Development Evaluation (PDE), a method for strengthening school organizational and research effectiveness. This report supplements an earlier account of the Program Development Evaluation (PDE) method for developing and evaluating programs by providing more explicit guidance in the creation and assessment of implementation and evaluation plans. Imperative, essential, and desirable standards for various elements of plans created using this method are described. Consultants, researchers, and program developers may apply these standards in determining whether or not they are actually implementing the PDE method, and these standards are useful in training workers to use the method. (Author/PN)

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STANDARDS FOR PROGRAM DEVELOPMENT EVALUATION PLANS

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The Johns Hopkins University

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The Center

The Center for Social Organization of Schools has two primary objectives: to develop a scientific knowledge of how schools affect their students, and to use this knowledge to develop better school practices and organization.

The Center works through three research programs to achieve its objectives. The School Organization Program investigates how school and classroom organization affects student learning and other outcomes. Current studies focus on parental involvement, microcomputers, use of time in schools, cooperative learning, and other organizational factors. The Education and Work Program examines the relationship between schooling and students' later-life occupational and educational success. Current projects include studies of the competencies required in the workplace, the sources of training and experience that lead to employment, college students' major field choices, and employment of urban minority youth. The Delinquency and School Environments Program researches the problem of crime, violence, vandalism, and disorder in schools and the role that schools play in delinquency. Ongoing studies address the need to develop a strong theory of delinquent behavior while examining school effects on delinquency and evaluating delinquency prevention programs in and outside of schools.

The Center also supports a Fellowships in Education Research program that provides opportunities for talented young researchers to conduct and publish significant research and encourages the participation of women and minorities in research on education.

This report, prepared by the Delinquency and School Environments Program, presents a set of standards for implementing Program Development Evaluation (PDE), a method for strengthening school organizational and research effectiveness.

Standards for Program Development Evaluation Plans

Abstract

This report supplements an earlier account of the Program Development Evaluation (PDE) method for developing and evaluating programs by providing more explicit guidance in the creation and assessment of implementation and evaluation plans. Imperative, essential, and desirable standards for various elements of plans created using this method are described. Consultants, researchers, and program developers may apply these standards in determining whether or not they are actually implementing the PDE method, and these standards are useful in training workers to use the method.

This document spells out in greater detail than we have elsewhere the standards for implementing the Program Development Evaluation (PDE) method in practice. These standards have a dual purpose: (a) they provide guidance for the researcher-consultant using the PDE method to conduct research while stimulating organizational development, and (b) they form a basis for the assessment of a plan to create or study change. The application of these standards assumes a basic knowledge of the PDE method. A description of that method (Gottfredson, 1982) should be read before attempting to use this document.

PDE is a complex set of interventions: it is a method for accomplishing the goal of increasing the usefulness of programs and research on them. The PDE method is intended to strengthen research and interventions to solve practical problems according to a specific theory of organizational change and development while doing useful research. This theory implies that several objectives must be met if organizational and research effectiveness are to be improved. These objectives include: (a) increasing the extent to which theories are used in developing programs, (b) increasing the use of careful, detailed, and feasible plans in developing programs, (c) increasing the use of valid information in program decision making, (d) increasing the relevance of information in program development and decision making, and (e) increasing the extent to which project implementers adopt the foregoing objectives (and indeed the theory underlying PDE) as their own.

All of the standards described in this document are aimed at one or more of these objectives. For example, we call here for clear statements of what outcomes project implementers expect to observe as short- and long-term effects of their efforts, and we call for the provision of information that enables the implementer to confirm or disconfirm those expectations. These steps are intended to accomplish the objective of increasing the perceived relevance and use of information.

These standards, although linked to a theory of organizational research and development, have multiple additional sources. The first of these is the principles of research design: Useful research must be concerned with validity, efficiency, robustness, cost, and

theory. The second is the psychology of the behavior of individuals and groups: Some of these standards are intended to build what is known of human motivation and effective performance into plans to manage an organization change and research effort. The third source is our experience in developing and implementing the PDE method in collaboration with a number of organizations.

These standards make clear that PDE is a highly complex method. Is there any way to simplify this process? We do not think so. Social programs are not only widely perceived as ineffective, but by and large they <u>are</u> ineffective. Evaluation research is widely perceived as irrelevant and useless, and by and large it <u>is</u> irrelevant and useless. There is no more justification in assuming that complex human problems that have heretofore defied solution--and many of which are regarded as intractable--will yield to simple approaches to solution than there is in assuming that it is easy to fly to the moon. The scientists, engineers, and managers who conducted the moon missions developed elaborate plans with clearly specified theoretical rationales and multiple checkpoints with a high degree of redundancy in systems to accomplish the difficult task of going to the moon. We make no apology for the complexity of the method for which we provide standards here. Our firm belief is that what may here appear complex is in fact a great simplification and systematization of the process required to solve human problems. If this method calls for more talent and investment of resources than are currently available, then more talent and more resources will be required to solve many of the world's problems.

Types of Standards

Various applications of the PDE method will embody its techniques to different degrees. But no one should be confused about whether PDE is actually being implemented, or whether the name alone is being applied to a set of activities that resemble PDE only slightly. To decrease ambiguity, we specify several kinds of standards: <u>imperative</u>, <u>essential</u>, and <u>desirable</u>. In addition, selected issues that are not really "standards" are mentioned.

Imperative

An imperative standard must be present in all applications of PDE. If an imperative standard is not met, the application is not following the PDE method. These are standards that we judge to be such an important part of the method that they must be present in <u>all</u> applications of the method.

Essential

An essential standard must be present in every complete application of the PDE method. Although judged not to be so central to the method that they must always be adhered to, if an essential standard is overlooked or ignored the resulting defect will weaken the application of the PDE method.

Desirable

A desirable standard is one that should be met if possible. Some desirable standards call for research methods or resources that are beyond the resources of some organizations and some consultants. Others may be applicable only in certain instances. As a general matter, desirable standards should be attended to and met as feasible

and applicable; the greater the extent to which these standards are achieved, the more effective and useful the research and development project will be.

Other Issues

Some other issues that should be considered in the development of any PDE activity are discussed at the end of several sections. PDE is value laden, and ethical social scientists will want to consider the ways their activities influence human welfare or the political context of the project, and their proper role in relation to the client or clients.

These standards do not stand alone; they are intended to supplement other standards, including the American Psychological Association, American Educational Research Association, and National Council on Measurement in Education (1974) Standards for Educational and Psychological Tests, the American Psychological Association Ethical Principles (1981), Standards for Providers of Psychological Services (1977), and Ethical Standards in the Conduct of Research With Human Participants (1973), and the Evaluation Research Society (1982) Standards for Program Evaluation. In contrast to those statements, which provide broad guidance on ethical issues, the present standards are intended to specify in concrete detail what is required to implement one specific type of intervention with organizations: Program Development Evaluation.

Problem Statements

The Process of Data-Guided Problem Definition

Imperative: Realism. PDE is a pragmatic exercise. Grandiose goals and unachievable aims are not "problems" in the language of PDE. The broad mission of an agency to fight poverty or improve education consequently may not be stated as a goal in a PDE plan. Concrete problems for which a resolution is conceivable are stated. If nothing can conceivably be done about a problem by a project, that is not a problem the project is addressing.

Essential: Needs assessment. Every problem statement should be based on some form of needs assessment; available evidence is used in performing this needs assessment. If hard data are not initially available, a vehicle for developing them must be specified. Needs assessment must be guided by data about the problems an organization is experiencing, its current level of functioning, or evidence about a discrepancy between performance and needed or desired performance. Accordingly, basing problem statements on epidemiological studies, opinion polls, surveys, archival or production records and so forth is desirable. The researcher must exercise considerable judgment in determining how thorough an initial needs assessment shall be.

Essential: Divergent views. Divergent views should be considered in specifying problems. First, not all members of an organization share the same perspective on organizational needs, and not all persons affected by the organization will share the organization's mananagement's views of needs. In addition to divergent values and perspectives, the views or opinions of any one person or group may be objectively incorrect. A careful needs assessment therefore involves consultation with a broad range of persons likely to be involved in or affected by the project, and it requires an open discussion of pri-

orities. Second, the participation of affected parties in the development of plans may be expected to increase the extent to which members of an organization adopt the perspective and practices of effective organization development and research embodied in the theory underlying PDE.

To make the assessment of the degree to which this standard has been met possible, records of who has participated in plan development are helpful.

Desirable: Normative information. The use of normative information to aid in the interpretation of the data is desirable. For example, knowledge that 70% of the parents of children in a school approve of the school's discipline policy is most useful if accompanied by information that it is typical that 85% of parents approve of school discipline policies.

Issues for the Researcher and Implementer

Several issues will arise in most PDE projects; each of these should be considered by the researcher as he or she develops the project.

Issue: Value judgments. Virtually all prioritization of goals involves value judgments. It is useful if the judgments and assumptions involved are described and labeled as such, together with a discussion of competing priorities and values.

Issue: Stakeholder identification. Clients, users, and stakeholders in the research should be clearly identified. Often a PDE project involves multiple clients, and this may present challenging ethical and practical issues for the researcher. Often the priorities of alternative clients may differ or be competing. Participants in a PDE project should know what they can expect of the researcher.

Issue: Redundancy of services. In determining problems to address in any project, consideration should be given to the range of services or programs being directed at problems. Even if alcoholism is a big problem in a community, a community that already has a vigorous alcoholism prevention and treatment program may have greater needs in other areas.

Issue: Who identifies the problem? Whether or not the "client" sees the problems selected as a problem is important. In general, when applying the PDE method the "client" defines the problems to be addressed by the project. In many, if not most, applications of PDE there will be multiple clients; not all of these will share the proximal client's definitions. In many, if not most, interventions with organizations the client's self-identified "problem" is incorrect from the perspective of the outside consultant, or the request for assistance may either seem inappropriate or be a request for an intervention other than the most useful one. Researchers will generally want to distinguish between their diagnoses of an organization's "problems" and those identified by organizational managers or clients; and researchers will generally want to regard all diagnoses as tentative. Researchers should constructively confront the client with their perceptions. Researchers must decide whether they can be helpful or can ethically procede with a project.

Issue: Human welfare. A primary aim of researchers using the PDE method is to promote human welfare. Each researcher should carefully attend to the ethical issues

involved in pursuing any particular project in light of this general aim.

Issue: Who is the client? To avoid misunderstandings, researchers using the PDE method should create an explicit understanding of who the primary client is, and who the secondary clients are.

Standards for Written Problem Statements

The following standards should be clearly observable in written documents produced using the PDE method:

Imperative: Distinct problem and theory. Application of the PDE method requires a separation of desired outcomes from ideas about their causes. Written problem statements must not confound cause with effect, or theory with problem. For example, "seventh grade Iowa test scores are ten points too low in Testemup Junior High School" is a problem statement. But, "little student participation in curricular decision making" is not. The reason for this is that the first statement describes a concrete problem, whereas the second statement describes one of many possible theories to explain a number of school outcomes. Statements of the second kind do not follow the PDE method, because the method separates causal states from their expected effects to enable tests of these causal hypotheses.

Imperative: Quantification. Problems are stated in behavioral and quantifiable terms, and quantitative indicators of the level of the problem are described and available. If quantitative indicators are not initially available, a plan to develop them is made and executed.

Essential: Concreteness. Written statements of problems should be specific and concrete rather than vague, abstract, or general.

Goal Statements

General Standards for Goal Statements

The following standards apply to the development and writing of goal statements according to the PDE method:

Imperative: Operational measures. The measurement operations to assess each goal are specified. These operations can actually be performed, i.e., it is possible to obtain information to measure each goal.

Imperative: Expected effects. The magnitude of the effect sought or anticipated is explicitly stated. Without a statement of how large an effect is expected, this expectation can not be concretely compared with information collected. In addition, information about expected effect size helps create an experimental design with sufficient statistical power. Statements of expected effect size should be clear (e.g., "one-half standard deviation," "five percent," or "from the 33rd to 50th percentile." Such statements are not vague or obscure; for example, words like "significantly," "noteworthy," "discernable" are avoided.

Imperative: Timing of effects. Goal statements clearly specify when their attainment is to be expected. This (a) promotes realism in plan development, and (b) aids in evaluation design by specifying when outcomes should be measured.

Imperative: Scope. The target group or scope of measurement is

specified. This means that the target population is defined in terms of personal, geographic, or community characteristics, and the limits or boundaries of the project are therefore also defined. "American Black teenage unemployment rates are double those of whites" is an acceptable problem statement only if the project is targeted at all Black teenagers in the entire United States.

Essential: Completeness. Goal statements are complete: a goal is stated for each problem.

Issue: Honesty. Goal statements are honest; little is to be gained by exaggerated, unrealistic goals, or statements of goals that are in fact not being sought. The goals should be realistically attainable and of moderate difficulty. Clearly some judgment is required in applying this exhortation.

Research Design Standards for Goal Statements

Imperative: Internal validity. A research design that will rule out all plausible rival causal interpretations is used if possible. The basis for inference about project effectiveness in bringing about each goal is specified. A number of methods can be used to achieve internal validity (Cook & Campbell, 1979).

Essential: Opportunism. Obvious measures of goals are not overlooked. For example, in a project aimed at increasing academic achievement in a school system with a standardized testing program, test scores derived from that program are not overlooked. A variety of archival records and other kinds of evidence can often be capitalized on in designing the research (Webb, Campbell, Schwartz, & Sechrest, 1966).

Essential: Power. The experimental or quasiexperimental design for the evaluation is statistically powerful (see Cohen, 1970).

Essential: Fall-back designs. Fall-back designs are anticipated. (It is often necessary to anticipate fall-back designs while at the same time guarding against the possibility that project implementers or research staff will regard the fall-backs as "good enough.")

Desirable: Multiple measures. Multiple measures are available for each goal.

Desirable: Decision making rules. Estimates of the disutility of Type I and Type II errors are made. These estimates should guide project decision making based on evaluation feedback by determining cutoff values for statistical tests. The risk of falsely concluding that evidence of effectiveness is lacking for an effective program can often be so great that conventional statistical significance levels make little sense, especially in pilot work where sample sizes may be small.

Theory Statements

In using the PDE method, theory statements make the rationale undergirding a project explicit.

Generating the Theory

Much confusion exists about the ways theories are created. Some commentators on theories in the behavioral science argue that few if any so-called theories really have the characteristics of sound theories, but philosophers of science continue to argue about what those characteristics are, about the meaning of "cause," and so forth. In using the PDE method, the most

important test of a theory is, "Is it useful?" A problem facing the researcher is the surfacing and explication of the often implicit theories held by practitioners, or of helping the implementer choose, create, and specify a theory of action using the ideas of others. Accordingly, a central task for the researcher is to help state a theory in propositional form so that it may guide intervention and be tested.

Useful theories have many origins: sometimes thay come from the systematic work of scientists who have stated theories or systematic perspectives; sometimes they are created by the synthetic activity of practitioners who aim to make sense of their experiences. There exists no single best source of theories.

The PDE method requires the statement of theories in propositional form where that is possible. But no one should be inappropriately seduced by the formalism of propositional statements. Such statements may serve to prematurely crystalize thinking and actually cause harm if taken too seriously (Kaplan, 1964). Formalism and propositional form are no substitutes for good ideas, and human behavior is often too complex and our knowledge too limited to allow for sensible modeling or formalization.

As a practical matter, however, unless a theory specifies statements such as, "If we do this, then that will happen," it can neither guide the choice of interventions in a project nor be tested. Accordingly, the PDE method requires the development of such propositional statements, and encourages active experimentation to test the statements in practical application (cf. Cook & Campbell, 1979, Chap. 1). A good theory has utility. It guides action, suggests new approaches, and suggests tests of its propositions or implications. A theory, no matter how formal, that leads nowhere is useless. Examples of propositions developed using the PDE method should resemble the following: "If 80% of children are imunized using vaccine X, the transmission of disease Y will cease." "If 65% of the households in a neighborhood actively watch for crime and report suspicious events to the police, the property crime rate will drop." "If each instance of disruptive behavior in the classroom is consequated with a soft verbal reprimand, the incidence of disruptive behavior will decline." "Employment of youths decreases the probability that they will be arrested for a crime."

A good theory explains the phenomenon of concern. Therefore, each action theory should be scrutinized to determine if it corresponds with what is known or believed to be true more generally. Does this theory make sense? Does some general principle or set of principles account for a large number of diverse observations?

Many useful theories are probabilistic. That is, their propositions are not of the form, "if X then Y," but rather of the form, "X increases (decreases) the probability of Y." Here we assert the usefulness of what Cook and Campbell (1979) call molar theories. In general, we do not know enough about a problem to specify all its causes or the conditions under which they operate. Nothing is to be gained by refraining from constructive theorizing simply because some epistimologies (operational dogma, essentialism) would label our language invalid. Much is to be gained from the elaboration of partial or molar theories accompanied by tests of those partial theories in practical application.

To be put to practical use, a theory must suggest operations to manipulate the causal variables, and to measure the outcomes. Developing a program and testing a theory involve a cycle of activities to sharpen up definitions of theoretical terms over time as the theory is tested and experience is gained. Of course, the statement of theoretical terms will become clearer as this process occurs. And, because any particular operation or measure is ambiguous, multiple measures and multiple operations are to be preferred when possible.

Standards for Developing Theory Statements

Although useful theories may have diverse origins, all theories that are useful for problem solving and organizational development using the PDE method have important features in common. The following standards are helpful in assessing and writing theories. The standards stated below provide guidance by spelling out some characteristics that a testable theory will have.

Imperative: Theory of action. The stated theory must form a realistic base for project actions. Grand theories that imply interventions beyond the resources or scope of a project are not useful, and theories that are too narrow for the resources or scope of a project are of diminished utility. An action theory must be translatable into statements of objectives and interventions. The theory must be such that it does suggest concrete actions that may be taken to solve the problem.

Imperative: Scope. The phenomenon the theory attempts to explain must be clearly stated. This statement determines the scope of the theory. Issues such as what the target population for the project will be (which were resolved in the problem definition stage) help define the scope.

Imperative: Internal consistency. The theory is internally consistent--it coheres as a statement, and no part contradicts or is implied to be false by any other part.

Imperative: Propositional form. The theory is stated in propositional form, so that it can be empirically tested by the operation of the project. Statements such as "Other things being equal, the more the A the more the B" or "If X then Y" are required.

Essential: Causal order. Theory statements should clearly indicate a hypothesized causal ordering. For example, "A leads to B" is a more useful theory statement than "A is linked to B." A diagram illustrating the causal order should either be drawn, or be easy to draw from the theory statement.

Linear causal orderings do not always capture the nature of behavioral processes. Sophisticated theories sometimes specify cyclical processes or reciprocal causation. At the same time, most projects take action primarily at one point in the process. The point of intervention then specifies a causal ordering underlying the project activities. The location of the intervention in this chicken-and-egg cycle must be clear.

Essential: Correspondence with evidence and other theory. A useful theory corresponds with all or most of the evidence available about a phenomenon: It fits with the facts insofar as they are known or understood. The validation of theories is a complex business, but some

theories are clearly invalid given an informed perspective on the phenomenon. An example may be helpful. Consider two alternative theories about worker productivity. A human relations perspective might imply that increasing worker satisfaction will increase productivity. But this theory has problems: First the evidence (Brayfield & Crockett, 1955) shows that job satisfaction is weakly associated with performance. Second, the general notion that reinforcement establishes and maintains behavior is much more solidly established (Pritchard, Leonard, VonBergen, & Kirk, 1976; Yukl & Latham, 1975). Third, theories (e.g. Porter & Lawler, 1968) exist which specify why job satisfaction may expected to be only weakly linked with performance. One might be able to increase male assembly line workers' job satisfaction by having attractive coctail waitresses in brief costumes serve beer on a continuous basis and do nothing (or more likely decrease) job performance. On the other hand, making the administration of desired rewards contingent on increased performance, as is implied by an alternative theory, appears more promising. In chosing a theory to guide a project, the available evidence about the validity of alternative theoretical perspectives should be used.

This standard is essential rather than imperative because it is sometimes impossible or impractical to convince project implementers of the invalidity of their personal theories. In such cases, it is in the spirit of the PDE method to subject the theory to empirical test. The researcher must, however, attempt to bring as much knowledge as possible to bear on the assessment of the theory undergirding an activity so that unnecessary research is avoided and each project stands on the shoulders of others.

Knowledge of the problem, and theories of the problem that have been subjected to some prior tests, are taken into account in developing the theory of action for a project.

Issue: Probabilistic statements. Determinism is often misunderstood. If appropriate, propositions should be stated in probabilistic form.

Standards for Written Theory Statements

The foregoing provide guidance for the development of theory statements. The following additional standards pertain to the written product of this process.

Imperative: Coherence of the plan. The theory must be a theory of the problem the project seeks to solve. The links between the problem, theory, and interventions developed should be clear and straightforward. Coherence can be completely assessed only by reviewing problems, theory, objectives, and interventions together. Furthermore, every major project component, or intervention, should be directly traceable to an element of the project's theory.

Imperative: Clear narrative. A theory must be stated in narrative form in crisp, clear, and unambiguous prose. This means that expression is direct and interpretable, that separate ideas are expressed distinctly, that each idea is developed sufficiently that readers can understand them, and that vague wording is avoided. For example, "weakened bonds to the social order" is by itself an imperfect theory statement. "The weaker the bonds to the social order (i.e., the less the attachment of youths with their parents and teachers, and the less youths perceive that educational attainment is essential to obtaining

valued personal goals) the more the delinquency" is a better theory statement. Even the latter statement should be elaborated considerably.

Essential: Parsimony. The guidance of the Bishop of Ockham should be followed: Theory statements should be no more complex than necessary to explain the phenomenon which is the object of the theory. (This principle is sometimes described with vivid imagery as Occam's (sic) razor.) A more parsimonious statement is not only more aesthetically pleasing, but also easier to test (Kaplan, 1964).

Essential: Generality. A sequiter of the foregoing standard is the requirement of generality. A general theory is superior to specific propositions because it is more robust: it explains more, and suggests more potential interventions. For example, a theory that students do not come to school because no one notifies the school when they hang out at the arcade is less general than a theory that students will engage in whimsical activities unless they are watched and their behavior is consequated. The latter theory is more useful because it suggests a broad array of community control interventions, whereas the former suggests only activity directed at the arcade attending behavior.

Essential: Comprehensiveness. The theory should be as complete an explanation as is possible at the time of the phenomenon which is its object. In general, a project that ignores an important known cause of a problem is likely to be ineffective in solving it. Thus, a cancer prevention project aimed at reducing exposure only to one of the known cancer risk factors may be expected to be less effective than a project aimed at reducing exposure to many or most of the known cancer risk factors. The more important the risk factor (or more influential the cause) the weaker a project that ignores it. Thus, a cancer prevention project that ignored the risks caused by cigarette smoking would be less effective than a project that ignored only exposure to sunlight.

Objectives

Relation of Objectives to Other PDE Elements

Objectives and interventions put the theory of action to work. Objectives are the causal states that a project's theory says must occur for the desired outcome to occur. Interventions are the activities performed to bring about those causal states (or objectives). In a treatment program designed to manage hypertension, for example, a theory may state that if salt intake is reduced, blood pressure will then be reduced as well. A physician prescribes a low sodium diet and gives the patient a low sodium cookbook and menu plan with instructions for the patient rigidly to adhere to the diet, eating only the prescribed foods. The physician proscribes all other foods. In this example, the patient's blood pressure is a measure of the goal, the sodium content of the diet consumed is a measure of the objective, and the preparation and consumption of the prescribed food (and only that food) are indicators that the intervention is being performed. A physiological measure assesses goal attainment, a chemical measure assesses the objective, and a behavioral measure assesses the intervention. (Implementation standards are discussed in a subsequent section: These standards are PDE's tools for assessing the faithfulness with which interventions are implemented.)

A second example is useful: A police chief theorizes that property crime in a certain suburban neighborhood could be lowered if more surveillance were possible. Of the many possible ways to increase surveillance, the chief decides to use members of the community in a "Crime Watch" program. The chief also theorizes, however, that community members do not currently perceive the importance of their roles in neighborhood control, and that they will only participate in surveillance if this citizen role is made more salient. In this example, the property crime rate in the neighborhood measures the goal, the ratio of daily reports of suspicious events in progress to crimes reported might be used to measure one of the objectives (surveillance), and the proportion of neighborhood residents signing an agreement to participate in the program and posting a "Crime Watch" sticker on their front doors might be used to assess the other objective (saliency of the citizen role). Finally, to implement the program the police chief would require each police officer to explain the Crime Watch program to the householder on each call for assistance and on every crime investigation, and would prepare a news release for the local media. Records of officer activity on visits to residents' homes and counts of television and newspaper news stories might be used to document the degree of implementation.

The foregoing examples clarify the relation between theory, objectives, and interventions; and they illustrate the value of treating each of these elements of the PDE process separately. Objectives are states hypothesized to cause the desired outcome. Interventions are activities undertaken to create the causal conditions necessary. We want light (goal) so we get tungsten hot (objective) by applying electrical current to a circuit in which a tungsten bridge is the point of great resistance (intervention). If hot tungsten did not glow, or if the light switch were not thrown, the bulb would not light.

Standards for Written Objectives

Many of the standards for written objective statements are the same as standards for written goal statements. Because each is important, however, the common standards are repeated here (although in abbreviated form) to emphasize their importance.

Imperative: Causal states. An objective is never an action taken. Actions are interventions, not objectives. Maintaining the distinction between actions (interventions) and causal states (objectives) is imperative because of the problematical link between the intervention and the objective. A group of people living in a repressive society may theorize that greater freedom will bring greater happiness, but the group would be mistaken to confuse the revolution (action) with freedom (objective). Often revolutions succeed merely in changing the boot on the peoples' necks. Objectives are intermediate outcomes; they lie between the action and the goal.

Imperative: Theoretical relevance. Objectives are operational measures of the action theory's causal variables.

Imperative: Operational measures. The measurement operations to assess each objective are specified. These operations can actually be performed, i.e., it is possible to obtain information to measure each objective.

Imperative: Expected effects. The magnitude of the effect sought or anticipated is explicitly stated.

Imperative: Timing of effects. Objective statements clearly specify when their attainment is to be expected.

Imperative: Scope. The target group or scope of measurement is specified.

Essential: Completeness. Each hypothetical causal variable is operationalized by a measure of an objective. This standard is essential rather than imperative, because as a practical matter all causal conditions may not be specifiable at the time, and because for many purposes a complete specification is helpful but not imperative. For example, a child who does not understand the principles of electricity may know nothing of the mechanism through which the light switch operates. For the child's purposes it is important to know that throwing the switch usually causes light. The child's control over the environment, however, falters if the fuse is blown or the light bulb is burned out or missing.

Issue: Realism. Objective statements are realistic. That is, they can plausibly be attained and are of moderate difficulty. Clearly some judgment is required in applying this standard.

Research Design Standards for Objective Statements

Imperative: Internal validity. A research design that will rule out all plausible rival causal interpretations is used if possible. The basis for inference about project effectiveness in bringing about each objective is specified.

Essential: Opportunism. Obvious measures of objectives are not overlooked.

Essential: Power. The experimental or quasiexperimental design for the evaluation is statistically powerful.

Essential: Good estimators. Messures called for by the research design are efficient and unbiased.

Essential: Fall-back designs. Fall-back designs are anticipated.

Desirable: Multiple measures. Multiple measures are available for each objective.

Desirable: Decision making rules. Estimates of the disutility of Type I and Type II errors are made. These estimates should guide project decision making based on evaluation feedback by determining cutoff values for statistical tests.

Interventions

The standards for interventions flow from considerations of (a) strength, (b) integrity, and (c) feasibility. See Sechrest, West, Phillips, Redner, and Yeaton (1979) for a discussion of the first two issues. In our adaptation "strength" refers to the theoretical plausibility of an intervention--the links between what is done and the objectives that must be met to accomplish a goal. "Integrity" refers to the faithfulness with which an intervention is carried out. "Feasibility" refers to the likelihood that the intervention can be implemented as intended. A strong intervention is one that is implied by a plausible theory, or one that is a close replication of another intervention known to work. An intervention with integrity is one that is carried out as antici-

pated. A feasible intervention is one the organization can see ways to adopt and implement.

In describing standards for the choice of interventions we will focus primarily on strength. Because of their special importance, considerations of feasibility and integrity are treated in more depth in separate sections of these standards on forcefield analysis and implementation plans.

The Choice of Interventions--Strength

Imperative: Target population. Interventions must be focused on the target population identified in the problem statement.

Imperative: Target objective. Interventions must be targeted at one or more objectives.

Essential: Comprehensiveness. Interventions should be aimed at bringing about all (or the most important) of the objectives.

Essential: Proximal priority. In choosing interventions, actions taken to most directly manipulate or bring about the causal state (objectives) the theory implies must be present must be given precedence over actions that may be expected to influence that causal state more remotely. The example used elsewhere (Gottfredson, 1982) of interventions aimed at cholera can be put to another use in illustrating this requirement. When a person has the disease (problem), he or she is in danger of dying due to dehydration and electrolyte imbalance (theory). A direct intervention (and therefore a strong and preferred intervention) is the administration of a "soup" containing water and electrolytes to rehydrate the person and restore electrolyte balance (objective). But when a cholera epidemic occurs in a community (problem) the treatment of victims is only an indirect intervention (and therefore weaker and less preferred intervention). Because cholera is transmitted from infected persons to others through contaminated drinking water (theory of transmission) action taken to break transmission by chlorinating wells and encouraging the populace to boil their water are more direct (and therefore stronger and more preferred) interventions. Finally, if cholera is endemic in a community (problem) this is usually because environmental sanitation is poor (theory) and actions taken to improve sanitation by constructing and encouraging the use of safe water supplies and sanitary latrines are direct and appropriate interventions because they make the water supply resistant to contamination by the cholora micro-organism (objective). Although other considerations in addition to the proximal nature of the intervention (such as the mission, forseeable lifespan, or budget of the intervention effort, or community sentiment) contribute to the wise choice of interventions, proximality is a major consideration.

Essential: Duration, frequency, dosage, and timing. An essential element of the choice of interventions is the determination of their appropriate duration, frequency, dosage, and timing.

It is self-evident that the description of nutritional interventions designed to promote the health of a population must involve statements about the amounts of various substances to be consumed with what frequency and at what stages in the life cycle. Too much calcium is toxic, and the body's requirement for this mineral is not constant over the life span. Too little cal-

cium during infancy, childhood, and adolescence is harmful, but calcium deficiency is rarely a problem in adulthood and indeed overconsumption of milk products is probably more widespread than deficiency among adults.

For an intervention designed to break the transmition of cholera during an epidemic, the intervention of water-boiling would specify that water is to heated during the epidemic for three minutes (duration), always (frequency), to 100 degrees Centigrade (dosage), before use (timing). For an intervention designed to help unemployed persons get jobs (Azrin & Besalel, 1980) it might be specified that persons attend a job club until they are employed (duration), every day (frequency), all day (dosage), if they are adults (timing).

Any of these elements--duration, frequency, dosage, and timing--that may be ambiguous must be described in an intervention statement.

Essential: Use of knowledge. Interventions should make use of knowledge about other successful and unsuccessful interventions. Often, where other interventions are known to have worked in the past to achieve an objective, a project's intervention should begin with as exact a replication of that intervention as possible, introducing changes only on an experimental basis. If project implementers can justify major deviations from interventions known to have worked in the past on the basis of presumed increased efficiency, effectiveness, or because of more limited resources, these deviations should be made on an experimental basis only. Interventions unsuccessful in prior attempts would be replicated only where ideas for ways to strengthen or modify them to cause them to be productive are available.

Choice of Interventions--Feasibility

Imperative: Perceived feasibility. Project implementers must perceive that a chosen intervention can be adopted and implemented. This means that they must perceive that resistance to any innovation can be overcome and that adequate resources to achieve implementation are available. This perception should be supported by a careful force-field analysis, and by an assessment of human, real, and financial resources.

Integrity of Interventions

Imperative: Actions taken. An intervention statement must specify what actions are to be taken to achieve an objective. Such statements must be clear and unambiguous. A statement such as "vocational counseling" is unclear and is ambiguous. "Vocational counseling using Parsons' (1909) methods," or "Simulated vocational counseling using Holland's (1979) Self-Directed Search," are clearer.

Essential: Manuals. The clearest specification of the actions taken in an intervention is a well worked out blueprint for behavior or a manual. The Job Club Counselor's Manual (Azrin & Besalel, 1980) is a good example of such a document. This manual must detail exactly what must be done, and include all instructions and forms necessary to implement and monitor the execution of the required actions. A complete manual also describes goals, objectives, theory, and required resources.

Essential: Staffing. The number and kinds of staff required to implement the intervention must be specified. A job description for each category of staff is required. Competencies that qualify the work-

ers to implement the intervention must also be specified. For example, an environmental sanitation campaign may require cement masons and community workers; a bridge construction project engineers and steelworkers; and a hospital physicians, nurses, laboratory technicians, and a psychological technician trained in the treatment of tracheotomy addiction. The general principle is that staff with the competencies to take the actions desired will be needed, and a careful plan anticipates this need.

Force-field Analysis (FFA)

Force-field analysis is a technique that is useful in developing feasible plans because it makes explicit the perceived obstacles to change--forces that maintain a status quo--and the resources for overcoming these forces or obstacles. Force-field analysis is a movable component of the PDE method. It often provides useful information in choosing a problem, in deciding whether or not a theory of action will be palatable or politically acceptable, in determining which objectives are most manipulable, in choosing among alternative interventions aimed at the same objective(s), in developing strategies to achieve adoption of an intervention, in developing plans to achieve faithful implementation of an intervention, and in devising plans for evaluation of project activities.

Four principles provide guidance in the application of FFA.

Imperative: Perceived feasibility. The individual or group to conduct the project must perceive that a path exists to change the status quo--to change practices or implement new ones. Put another way, the individual or group must expect that the available resources are sufficient to overcome each perceived obstacle. If a path is perceived and there is no uncertainty about it, formally performing a FFA may be unnecessary. When there is uncertainty, conducting a FFA is imperative.

Essential: Completeness. All perceived obstacles must be listed and systematically considered. This allows a rational and systematic consideration of resources for overcoming obstacles, turning them into resources, or designing plans to go around an obstacle or render it irrelevant. Unless this task is approached systematically, useful strategies are often overlooked because workers despair of attempting innovation in view of what may be perceived as intractable obstacles.

Essential: Open-mindedness. FFA is performed before promising ideas are abandoned.

Desirable: Variety. Although no complete list of the kinds of forces that may be present is possible, it is possible to list some of the kinds of obstacles and resources that should be considered. This list includes money, attitudes, talents, norms, structural arrangements, contracts or agreements, power or influence, management practices, rewards, punishments, and time.

Strategies: The Management Plans

According to the PDE method, a strategy is a plan for getting the work done. A complete strategy has three kinds of elements. The first of these are the critical benchmarks required to bring about a change in the status quo and to maintain that change. These critical benchmarks are changes in the field of forces that determine what the status quo

will be: When critical benchmarks are attained, the status quo changes. The second kind of element in a strategy are the implementation standards that guide the work of project implementers by specifying what constitutes faithful implementation of the interventions. These standards provide concrete day-to-day guidance and worker reinforcement, and they allow managers to monitor the quality of the interventions. The third kind of element are the tasks required to bring about critical benchmarks and to achieve implementation standards. These tasks specify who will do what, when. Examples of critical benchmarks, implementation standards, and tasks may be found in Gottfredson (1982).

General Standards for Strategies

Imperative: Communicability. The plan to manage change and implement interventions must be communicable. A narrative statement of what the plan involves should be prepared to provide coherence to the lists of details usually developed.

Imperative: Inclusion of benchmarks. Every management plan spells out the critical benchmarks that must be achieved to get an innovation adopted and maintained.

Imperative: Inclusion of implementation standards. Every management plan spells out the standards that must be met to faithfully implement the intervention(s), or has as a critical benchmark the completion of such implementation standards to be applied at a later time.

Essential: Distinctions among elements of the plan. Tasks must be distinguished from critical benchmarks and implementation standards. Each of these elements in management plans serves a distinct purpose: Tasks provide day-to-day guidance to workers and their accomplishment is rewarding; critical benchmarks signal changes in the force-field and are necessary to manage innovation; implementation standards indicate the faithfulness with which an intervention is being implemented.

Desirable: Task statements. A complete enumeration of tasks is usually desirable. When the nature of the tasks is ambiguous, or any uncertainty about who is to do what by when exists, an enumeration of tasks is essential.

Critical Benchmarks (CB's)

Imperative: Consistency with FFA. Critical benchmarks should clearly follow from a force-field analysis. (Critical benchmarks are to FFA what objectives are to theory.)

Imperative: Concreteness. CB's must be statements of specific, observable changes in driving or restraining forces.

Essential: Dates. Each critical benchmark must specify a date by which it is expected to have been met.

Essential: Completeness. The set of CB's listed must be complete in the sense that all or the most important of the restraining forces are coped with (overcome, converted, or rendered impotent).

Implementation Standards (IS's)

IS's should be the result of a careful consideration of the characteristics of interventions implied by the project's theory of action. They should also use information from previous interventions about the characteristics of those interventions necessary for effectiveness.

Imperative: Provisions for monitoring. Implementation standards state the procedures used to monitor interventions, and the frequency, timing, and sampling procedures for this monitoring. IS's must be specific, observable, dated, and recurrently monitored.

Imperative: Observable. IS's must be observable conditions or behaviors. They do not specify the "potential" to do anything, they specify what is done.

Essential: Competencies and time. If the strategy involves the use of staff with special skills or competencies IS's must be created to determine whether staff actually have these skills or competencies. IS's to specify and monitor the extent to which sufficient time is being devoted to the required activities are necessary.

Essential: Comprehensiveness. The plan must contain IS's for each element of the intervention.

Task Statements

Imperative: Who, what, when. A task statement must specify who does what by when.

Essential: Detail. Task statements are sufficiently detailed that workers know what to do.

Management Plan for Evaluation

Evaluation is a project component like any other. Accordingly, a clear and detailed management plan for evaluation activities is required. Most of what has been discussed already therefore applies here. A few additional special standards, and some that require emphasis, are outlined here.

Imperative: Management plan. A detailed management plan for evaluation, developed from a careful forcefield analysis, is imperative.

Essential: Responsibilities. The foregoing management plan fully lays out responsibilities for collecting and analyzing data.

Essential: Realism. The scheduling of information flow is realistic.

Essential: Management and research needs. The management and research needs are met by the data collection schedule.

Essential: Information quality. Implementation standards are developed to specify the quality of information required. Such standards will involve, for example, sampling procedures, response rates, construct validity of the measures, and timing of randomization.

Standards for Information Feedback

In the PDE method information is a tool of project development. Information is used to reexamine each element of a program plan in the light of evidence to determine whether or not changes or improvements may be useful. Elements may be added, deleted, or modified if information is feedback to implementers and used by them. The following standards provide guidance in deciding what information to gather and in feeding back information to project implementers:

General Standards for Feedback

Imperative: Expected vs. observed. Information is directly linked to conditions the project implementers expect to observe. Thus, information about goal attainment is presented in conjunction

with information about initial expectations. Similarly, information derived from monitoring implementation is presented in conjunction with information about the implementation standards. Discrepancies between expected and observed outcomes are highlighted. Presenting information in this fashion is intended to make its perceived relevancy high, and to provide motivation through the tension inherent in a discrepancy between what is expected and what is observed to be happening.

Imperative: Collaboration. The determination of what information to collect, the interpretation of the information, and decisions about project modification are activities in which project implementers and researchers mutually influence each other. This mutual influence is intended to keep the research relevant to the project and the project relevant to the research.

The Process of Delivering Feedback

Imperative: Timeliness. Information must be provided before it is useless for making project adjustments. Information is most useful if present at the time a decision is to be made, such as during natural planning occasions. It is essential that project implementers identify such occasions. Obviously, feedback of information about tasks and critical benchmarks, and implementation standards may often be needed more frequently or sooner than information about objectives or goals. Frequently project implementers themselves must gather and interpret short-term information to meet this information need.

Imperative: Time to review information. Researchers and implementers must plan for and spend ample time together to review and interpret information.

Imperative: Understandability. To be used, information must be understood by project implementers. Because implementers differ greatly in their sophistication in using information, no uniform guidelines are possible. The following key ideas, however, are helpful: (a) Keep feedback as simple as possible. (b) Avoid esoteric statistics in displays; translate complex results into plain English or graphs whenever necessary. (c) Make information self-interpreting if possible by, for example, the use of norms or verbal interpretations. (d) Make discrepancies between expected and observed outcomes obvious (e.g., by using the metric of the expecteds to present information about observeds, and by presenting expecteds and observeds together). (e) Accompany tables or graphs by narrative interpretations. (f) Do not provide too much information at once; highlight critical information. (g) Use project decision-makers' categories and concepts. (h) Present information in ways that can be understood by project implementers.

Imperative: Unintended consequences. The possibility of side-effects or other unintended consequences of an intervention or decision always exists. Plans should be made to scan the environment for such unintended consequences and measure them as appropriate. Information about unintended consequences is also fedback to project implementers.

Essential: Constructive feedback. Information should be presented using a constructive, persuasive style--using for example the guidance provided by Hakel, Sorcher, Beer, and Moses (1982). Tact, patience, honesty, concreteness, and helpful suggestions are needed.

Issue: Appearance of validity. In some circumstances information may appear to have more legitimacy if collected over extended periods of time, for large samples, etc. There is no necessary connection between the utility or validity of information and the extensiveness of efforts to collect it.

Content of Information Feedback

Imperative: Links between information and plan components. Three conditions are imperative in providing information of relevance to project decisions: (a) Links between the information and project goals, objectives, or operations are explicated. (b) Information is directly aimed at isues raised by the project; or it provides clear information about the project's theory, goals, objectives, critical benchmarks, or implementation standards. (c) Information highlights unintended consequences or important but unexpected observations.

Essential: Informed observations. Researchers must provide information derived not only from formal data gathering activities, but also from their observations of project structure, communication, decision making, goals, and activities; and from behavioral theory and research. These observations are linked to project goals, theory, objectives, interventions, critical benchmarks, and implementation standards as appropriate. Observations of mismatches between project theory and interventions are especially important.

Essential: Comprehensivness. Information is provided about all, or the most important of, a project's elements.

Ethical Concerns

Several ethical issues may arise more frequently in the feedback process using the PDE method than in other kinds of research. Some of these are highlighted by the following issues:

Issue: Welfare of subjects. The rights, privacy, and welfare of all individual subjects of research must be stringently safeguarded.

Issue: Feedback to all stakeholders. Although not imperative when using the PDE method, it is often highly desirable (for both practical and ethical reasons) to provide relevant information to all stakeholders in an evaluation research project. The timing, content, and relevance of information flow often raises important ethical issues discussed elsewhere (Evaluation Research Society, 1982).

Issue: Inappropriate use of information. Researchers must attempt to educate their clients in the appropriate use of information. Special cases of sensitive information require careful consideration in light of ethical standards elaborated elsewhere. Deliberate distortions of information or evaluator statements occur frequently--not everyone shares the ethical perspectives of researchers. (See Evaluation Research Society, 1982.)

Issue: Limitations of evidence. Researchers must make the limitations of their research methods clear when presenting feedback.

Issue: Trust. Effective programs are more likely to be developed when implementing organizations trust the researchers to bring both the good and the bad news. Often, however, research methods are necessarily so complex that project

implementers can not possibly evaluate the research. They must therefore trust the researchers, thereby possibly becoming dependent. This complexity can raise important ethical issues, and at the very least implementers should be assisted in their attempts to get competent second opinions.

Development

The PDE method recognizes that projects change over time with experience. The PDE plans must therefore also change as the project develops. Each component of the plan may change: Problem, goals, theory, objectives, interventions, analyses of the forcefield, and so on. The following additional standards are also required:

Imperative: New information needs. When project decisions are made within the PDE framework, new information needs generally emerge. Steps must be taken to develop the information required to examine the consequences of project decisions.

Imperative: Periodic review. Occasions must be created for the periodic review and revision of the entire plan.

Imperative: Thorough review. Every part of the program and its evaluation should be reassessed in these periodic reviews.

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